

Dorsey, Nancy

From: Dorsey, Nancy
Sent: Tuesday, December 30, 2014 4:56 PM
To: Charles Lord; Patricia Downey
Subject: more swarm volume comments
Attachments: Sandridge SUMMARY.xlsx

Aberdeen 3; 119-02088 no reports received apparently

These reports are for constant rate and constant pressure...most likely no gauges

- Ritchey 2; 119-30394
- Stanolind 3; 119-04284

These are weekly reported or erratically reported

- Oestman 2; 081-20770; 0 volume
- Sanders 3; 081-01441; erratic reporting
-

Thompson 3; 119-02347

- 11/10-12/1 was weekly reported.
- Which is correct?
 - 12/1 weekly = 560 bbls
 - 12/1 daily = 80

Do you want copies of my compiled sheets?

Nancy S. Dorsey
Environmental Scientist
Oklahoma Class II Program Manager
WQ-SG EPA Region 6
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FAX 214-665-2191

Dorsey, Nancy

From: Dorsey, Nancy
Sent: Tuesday, December 30, 2014 11:18 AM
To: Charles Lord; Patricia Downey
Subject: swarm volume wells?

New Dominion once reported data for the Wilzetta SWD and Pernicka SWD from 10/28-11/10/14. As I do not see these wells listed on the AAA Weekly Tracking sheet, were these just an extra report? Wilzetta is certainly near the first high magnitude earthquake at Prague, but before the new system.

Thanks,
Nancy

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Dorsey, Nancy

From: Dorsey, Nancy
Sent: Tuesday, December 30, 2014 11:14 AM
To: 'Patricia Downey'
Subject: RE: Swarm report issue

I mentioned to Charles on the phone this AM, that it would be helpful on these requests to ask for the early year's data as well. The previous year 'should' have been reported on the 1012's, but the current year isn't usually available, so there is nothing to compare the daily reporting to. Even if the earlier data is monthly, it would be helpful to have a more complete picture. ☺

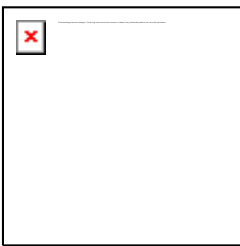
I am trying to figure out a way to automate plotting and reviewing the information OCC is receiving. Including the API in the table lists would help a lot, so uploading can be more efficient.

Did you have a good holiday?

From: Patricia Downey [mailto:P.Downey@occemail.com]
Sent: Tuesday, December 30, 2014 10:53 AM
To: Dorsey, Nancy
Subject: RE: Swarm report issue

Hmmm. I had already talked to them about it. okay

Patricia J. Downey
Manager, Underground Injection Control
Oklahoma Corporation Commission
P.O. Box 52000
Oklahoma City, OK 73152
405-522-2745



From: Dorsey, Nancy [mailto:Dorsey.Nancy@epa.gov]
Sent: Monday, December 22, 2014 8:38 AM
To: Patricia Downey; Charles Lord
Subject: Swarm report issue
Importance: High

It appears that operator 11938 has been changing the name but not the data on their swarm volume reports. Sometimes its Fagan 1, others its Amason 3, but all the monthly information is identical. They have never reported all three wells (inc. State Moore 5) on the same sheet.

Happy Holidays!
Nancy

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Dorsey, Nancy

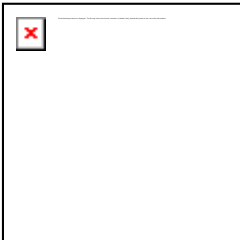
From: Dorsey, Nancy
Sent: Monday, December 29, 2014 3:40 PM
To: 'Patricia Downey'
Subject: RE: 1012 pressure reporting ?

They are well within their pressure allowance, I just wonder how trustworthy the pressure numbers are when they change from 300 to -5 without a workover reported.

From: Patricia Downey [mailto:P.Downey@occemail.com]
Sent: Monday, December 29, 2014 3:36 PM
To: Dorsey, Nancy
Subject: RE: 1012 pressure reporting ?

The well is permitted for 600 psi

Patricia J. Downey
Manager, Underground Injection Control
Oklahoma Corporation Commission
P.O. Box 52000
Oklahoma City, OK 73152
405-522-2745



From: Dorsey, Nancy [mailto:Dorsey.Nancy@epa.gov]
Sent: Monday, December 29, 2014 3:31 PM
To: Charles Lord; Patricia Downey
Subject: 1012 pressure reporting ?

I noticed that the Olson 1-20 SWD: 109-00109 went from a tubing pressure of around 275 psi average to on a vacuum apparently by changing operators!

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Dorsey, Nancy

From: Dorsey, Nancy
Sent: Friday, December 19, 2014 12:46 PM
To: Charles Lord; Patricia Downey
Subject: MORE swarm volume questions
Attachments: DENNIS SWD summary.xlsx; DEVON summary.xlsx

Importance: High

The DENNIS SWD swarm volume spreadsheets seem to have some serious issues. At a guess the dates are corrupted on a number of sheets. This is based on a large gap of missing dates and repetition of dates with different values. I dropped them into a summary spreadsheet, like how I think it works with a comment column listing the spreadsheet date.

The Devon reports are inconsistent and have numerous gaps as shown on the compiled version.

- Devon 10-14
 - Date ranges run from
 - 10/7-10/13
 - 10/1-10/13 Downing 1-31
 - Downing 1-7 SWD; says tubing pressure correction
- Downing 1-31 SWD flipped tubing pressure and volume?
- Devon wells 10-27
 - Fuxa 25 = Harvey 1-11 data

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Dorsey, Nancy

From: Dorsey, Nancy
Sent: Thursday, December 18, 2014 3:33 PM
To: Patricia Downey; Charles Lord
Subject: swarm volumes

Hi folks,

I notice that some of the operators supplying daily data have interesting interpretations of the directions....

- omitting pressure information is really common.
- Dakota supplied one day for each week.
- __ data says the volume units are bbl/mcf. How is that useful?
- Where does the latitude and longitude come from, the operator?
 - Some have the same latitude and longitude for all the wells reported.
 - Bostian SWD 17-2 has a different location than listed in the WellBrowseWebforms. 36.03008, -97.11356 versus 36.02938738, -97.1133567. (not very close)

A number of former Calyx Energy current American Energy wells either do not have 1002As or final permits/orders:

- Judge South 33-18n-2e, 119-24260. There is no 1002A filed for this well, THOUGH IT WAS SPUD ON 8/27/14. There is no permit, 1075 or 1012 listed either. They list the permit number (application actually) as 201400148.
-

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Dorsey, Nancy

From: Dorsey, Nancy
Sent: Wednesday, November 19, 2014 8:46 AM
To: Charles Lord; Jim Phelps
Cc: Patricia Downey
Subject: other potential permit ?--high vol arbuckle with three laterals

This may be an issue...or not.

133-24859 Trixie 1-3 SWD; permit 1007610013 Viola-Simpson-Arbuckle 100,000 BWD lists two laterals in the permit.
The permit attachments and 1002A all list three laterals.

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Dorsey, Nancy

From: Hildebrandt, Kurt
Sent: Thursday, October 30, 2014 2:56 PM
To: Dorsey, Nancy
Subject: RE: OK HOUSE OF REPS: (IS) Interim Study 14-002
Attachments: 14-002_Oklahoma Geological Survey Seismic Monitoring Program_presentation.pptx; 14-002_Oklahoma Corp Commission_Oil and Gas Conservation Division_Dir Baker presentation.ppt; 14-002_Oklahoma Earthquakes_Risks for the State and Industry_Halihan presentation.pptx

[Here are the more pertinent ones](#)

From: Dorsey, Nancy
Sent: Thursday, October 30, 2014 2:51 PM
To: Hildebrandt, Kurt
Subject: RE: OK HOUSE OF REPS: (IS) Interim Study 14-002

[Nope, missed that!](#)

From: Hildebrandt, Kurt
Sent: Thursday, October 30, 2014 2:46 PM
To: Dorsey, Nancy; Bates, William; Bierschenk, Arnold; Dellinger, Philip; Johnson, Ken-E; Kobelski, Bruce; Lawrence, Rob
Subject: RE: OK HOUSE OF REPS: (IS) Interim Study 14-002

[Same here \(no surprise\). Did you download the PowerPoint Presentations that were available?](#)

From: Dorsey, Nancy
Sent: Thursday, October 30, 2014 2:20 PM
To: Bates, William; Bierschenk, Arnold; Dellinger, Philip; Hildebrandt, Kurt; Johnson, Ken-E; Kobelski, Bruce; Lawrence, Rob
Subject: OK HOUSE OF REPS: (IS) Interim Study 14-002

<http://www.okhouse.tv/radViewVideo.aspx?VideoID=664>

Our system won't play this in Dallas.

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Dorsey, Nancy

From: Holland, Austin A. <austin.holland@ou.edu>
Sent: Wednesday, September 24, 2014 8:43 AM
To: Justin Rubinstein; Dorsey, Nancy
Cc: Tyrrell, Timothy; Craig Pearson; Ben Grunewald; Scott Ausbrooks; Gertson, Rod; Bauer, Robert A; Linda McDonald; Bates, William; ROVELLI, BRIAN (GE Global Research); smunews@smu.edu; ccabarcas@hilcorp.com; furnace@hilcorp.com; rex@kgs.ku.edu; Rick.Simmers@dnr.state.oh.us
Subject: Re: Monitoring Subgroup - NEWS

Hi all,

Again, I could not make the call. I really apologize. While Justin's skepticism is probably appropriate there is a little more hope. Oklahoma has maintained a magnitude of completeness near 2 since about 1978 although it may be a little higher and more variable through time. It is true that California has the best density of earthquake monitoring instrumentation, but it also has very different attenuation characteristics. In the mid-continent a M2 level of detection is much more achievable than in the western US. Oklahoma is not only aiming for a sub-magnitude 2 level of completeness with network upgrades, but is working to improve earthquake parameter accuracy at the magnitude 2 level. As the desired level for magnitude of completeness goes down about a half a magnitude unit the cost of operations go up roughly an order of magnitude. This is a rough ball park number but is certainly something to consider. I have a poster I presented at the SSA in 2011 which shows the magnitude of completeness for Oklahoma. http://wichita.ogs.ou.edu/documents/SSA2011_regionlnetwork.pdf

Along with our permanent station goal we will have a number of temporary seismic station systems which can be used as response in specific cases, but in addition potentially to monitor areas as they are being developed. In addition we have a station sponsorship program where a company or possibly other entity can sponsor a station for some amount of time say while a field is being developed. These sorts of partnerships benefit both parties and can dramatically reduce detection thresholds in key areas. I am also glad to report that we do have now one such sponsorship and hopefully others will come along as time goes on.

Regards,

Austin A. Holland

Research Seismologist | Oklahoma Geological Survey

The University of Oklahoma Mewbourne College of Earth and Energy

Sarkeys Energy Center, 100 E. Boyd St., Room E-128, Norman, OK 73019-0628

austin.holland@ou.edu | PH: (405) 325-8497 | CELL: (405) 361-9967 | FAX 325-7069

From: Justin Rubinstein <jrubinstein@usgs.gov>
Date: Tuesday, September 23, 2014 at 8:33 PM
To: "Dorsey, Nancy" <Dorsey.Nancy@epa.gov>
Cc: "Tyrrell, Timothy" <Timothy_Tyrrell@xtoenergy.com>, Craig Pearson <Craig.Pearson@rrc.state.tx.us>, Ben Grunewald <ben@gwpc.org>, Scott Ausbrooks <Scott.Ausbrooks@arkansas.gov>, Austin Holland <austin.holland@ou.edu>, "Gertson, Rod" <Rod.Gertson@dvn.com>, "Bauer, Robert A" <rabauer@illinois.edu>, Linda McDonald <lmcdonald@sandridgeenergy.com>, "Bates, William" <bates.william@epa.gov>, "ROVELLI, BRIAN (GE Global

Research)" <BRIAN.ROVELLI@ge.com>, "smunews@smu.edu" <smunews@smu.edu>, "ccabarcas@hilcorp.com" <ccabarcas@hilcorp.com>, "furnace@hilcorp.com" <furnace@hilcorp.com>, Rex Buchanan <rex@kgs.ku.edu>, "Rick.Simmers@dnr.state.oh.us" <Rick.Simmers@dnr.state.oh.us>

Subject: Re: Monitoring Subgroup - NEWS

All

I missed the last call, so I apologize if I'm repeating the discussion. I think the goal of a M2.0 magnitude of completeness is laudable but probably not realistic. For example, in most parts of California, which is the mostly densely instrumented state, the magnitude of completeness is higher than 2.0. As Nancy noted, the magnitude of completeness of the COMCAT (the main USGS catalog) is around 3.0 for the CEUS and that the USGS aims to detect and locate all $M \geq 2.5$ earthquakes. Given that there are 10 times more M2s than M3s, we'd require far denser instrumentation than we currently have. We'd also need more analysts.

I'm also curious as to where the figure on the upper left of the last slide comes from. If I am reading it correctly, it's showing a magnitude of completeness level. I think it's pretty optimistic as to the USGS detection capabilities.

I don't want to be discouraging because I think enhanced monitoring is critical. More and more case studies are showing microseismicity beginning shortly after the commencement of industrial activities and before any larger earthquakes. It is a key tool that can be used to make decisions.

Regards

Justin

On Mon, Sep 22, 2014 at 2:05 PM, Dorsey, Nancy <Dorsey.Nancy@epa.gov> wrote:

I added a few comments and revised one bit—to promote discussion.

From: Tyrrell, Timothy [mailto:Timothy_Tyrrell@xtoenergy.com]

Sent: Monday, September 22, 2014 9:56 AM

To: Craig Pearson; Ben Grunewald

Cc: Scott Ausbrooks; austin.holland@ou.edu; Gertson, Rod; Bauer, Robert A; Linda McDonald; Dorsey, Nancy; Bates, William; Justin Rubinstein; ROVELLI, BRIAN (GE Global Research); smunews@smu.edu; ccabarcas@hilcorp.com; furnace@hilcorp.com; rex@kgs.ku.edu; Rick.Simmers@dnr.state.oh.us

Subject: RE: Monitoring Subgroup – NEWS

All,

Per Craig's note below, I'm reaching out to you for your help. Craig would like us to take a run at summarizing what we discussed on our telecom last month as well a slide or two describing the current status of monitoring capability vs a minimum needed capability and descriptions of how to get from here (status quo) to there (desired future state) financially, political and operationally?

I have built a few brief pages to get the ball rolling. There is lots of opportunity for improvement especially in filling out future state information! Please feel free to edit/change/build upon the attached pack. I'll compile the feedback and recirculate to the group.

Please let me know if you have any questions.

Thanks,

Tim Tyrrell

XTO Geoscience Technical Manager

[817-885-3742](tel:817-885-3742) Office

[713-702-3267](tel:713-702-3267) Cell

-----Original Message-----

From: Craig Pearson [<mailto:Craig.Pearson@rrc.state.tx.us>]

Sent: Wednesday, September 17, 2014 2:14 PM

To: Ben Grunewald

Cc: Scott Ausbrooks; austin.holland@ou.edu; Gertson, Rod; Bauer, Robert A; Tyrrell, Timothy; Linda McDonald; Dorsey.Nancy@epa.gov; Bates, William; Justin Rubinstein; ROVELLI, BRIAN (GE Global Research); smunews@smu.edu; ccabarcas@hilcorp.com; furnace@hilcorp.com; rex@kgs.ku.edu; Rick.Simmers@dnr.state.oh.us

Subject: Re: Monitoring Subgroup - NEWS

GWPC Seismic Monitoring sub-group,

Tim Tyrell will be reaching out to you soon for assistance in preparation for our meeting in Seattle. Please support him as best you can.

Thanks in advance,

Craig Pearson

Sent from my iPhone

> On Sep 17, 2014, at 8:28 AM, "Ben Grunewald" <ben@gwpc.org> wrote:

>

> Monitoring subgroup.

>

> I hope everyone is able to participate in the upcoming GWPC Annual Forum...

>

> Attached is latest agenda.

>

> Induced Seismicity will be Sat. afternoon and Sunday morning...

>

> THANKS!

> Ben Grunewald

> [405 516 4972](tel:4055164972)

>

> From: Ben Grunewald

> Sent: Monday, August 25, 2014 9:30 AM

> To: Ben Grunewald; 'Scott Ausbrooks'; 'austin.holland@ou.edu'; 'Gertson, Rod'; 'Bauer, Robert A'; '[Timothy Tyrrell@xtoenergy.com](mailto:Timothy_Tyrrell@xtoenergy.com)'; 'Linda McDonald'; 'Dorsey.Nancy@epa.gov'; 'Bates, William'; 'Justin Rubinstein'; 'ROVELLI, BRIAN (GE Global Research)'; 'smunews@smu.edu'; 'ccabarcas@hilcorp.com'; 'furnace@hilcorp.com'; 'Craig.Pearson@rrc.state.tx.us'

> Cc: 'rex@kgs.ku.edu'; 'Rick.Simmers@dnr.state.oh.us'

> Subject: Monitoring Subgroup - NEWS

>

> See 2 items below...

>

> Have you seen this from USGS???

>

> <http://earthquake.usgs.gov/regional/ceus/products/OKeqanimation.php>

>

>

>

> Study: Less shake from fake quakes

> Fuel Fix, Fort Worth Star-Telegram, Longview News-Journal

> August 18, 2014

> By: Seth Borenstein, AP

>

> WASHINGTON (AP) — Man-made earthquakes, a side effect of some high-tech energy drilling, cause less shaking and in general are about 16 times weaker than natural earthquakes with the same magnitude, a new federal study found.

>

> People feeling the ground move from induced quakes — those that are not natural, but triggered by injections of wastewater deep underground— report significantly less shaking than those who experience more normal earthquakes of the same magnitude, according to a study by U.S. Geological Survey geophysicist Susan Hough.

>

> Distance matters in this shaking gap, however. For people within 6 miles of the fault, artificial and natural quakes feel pretty much the same, she said.

>

> Hough studied similar-sized man-made and natural quakes in the central and eastern United States from 2011 to 2013, comparing the reported magnitude to what people said they felt in the USGS electronic “Did You Feel It” survey. She found that while two different types of temblors may have had the same magnitude as measured by seismographs, they had distinct differences in what people said they felt.

>

> The way artificial quakes felt was equivalent on average to a natural quake that had a magnitude 0.8 smaller. So a 4.8 induced quake felt like a 4.0 quake, Hough said. The magnitude scale used by USGS and others is mathematically complex, but a drop in 0.8 magnitude translates to about 16 times less strength or energy released.

>

> Sometimes the difference is even bigger. Hough said a 5.3 August 2011 man-made quake in Trinidad, Colorado, actually felt like a 4.0 quake, which is about 90 times weaker, based on the thousands of responses in the “Did You Feel It” survey system. The study, published Monday in the Bulletin of the Seismological Society of America, looked at quakes in Oklahoma, Colorado, Arkansas, Texas and Ohio. It included a 5.7 quake in Prague, Oklahoma, in November 2011 that injured two people and damaged 14 houses, which Hough said felt like 5.1 magnitude natural quake.

>

> “The hazard of these earthquakes is lower than what you’d expect,” Hough said. “It’s not that there’s no hazard, it’s just that it’s a little better than you might think.”

>

> Man-made earthquakes have become a big concern recently as hydraulic fracturing, or fracking, and other drilling injects wastewater deep underground. Scientists say that sometimes triggers shifts along existing and previously unknown faults. Oklahoma has had more than 300 earthquakes of magnitude 3 or more — strong enough to feel locally but too weak to cause damage — since Jan. 1. Before 2007, Oklahoma averaged only one quake a year of that size.

>

> The artificial quakes may have less energy because the fault is lubricated by the injected wastewater, making it easier to slip, Hough theorized.

>

>

> THANKS –Ben

> [405 516 4972](tel:4055164972)

>

>

>

>

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Justin Rubinstein Ph.D.

US Geological Survey

345 Middlefield Road/MS-977

Menlo Park, CA 94025

<ftp://ehzftp.wr.usgs.gov/jrubinstein/index.html>

Ph: (650) 329-4852

Dorsey, Nancy

From: Dorsey, Nancy
Sent: Thursday, September 18, 2014 8:49 AM
To: Hildebrandt, Kurt; Dellinger, Philip; Lawrence, Rob; Bierschenk, Arnold; Bates, William; Johnson, Ken-E; Kobelski, Bruce
Subject: RE: Amended Draft Response Plan

The Arbuckle is the primary disposal zone in Oklahoma, especially in the 'shaky' regions. Need I say more?

From: Hildebrandt, Kurt
Sent: Friday, September 12, 2014 2:21 PM
To: Dellinger, Philip; Dorsey, Nancy; Lawrence, Rob; Bierschenk, Arnold; Bates, William; Johnson, Ken-E; Kobelski, Bruce
Subject: RE: Amended Draft Response Plan

Thanks Phil. The one thing to remember about the disposal zone (the Arbuckle) is that it is under pressured and is taking fluids on a vacuum as opposed to any surface pressure. However, I'll agree that a better explanation/justification of the six mile radius would help their position.

From: Dellinger, Philip
Sent: Friday, September 12, 2014 10:49 AM
To: Hildebrandt, Kurt; Dorsey, Nancy; Lawrence, Rob; Bierschenk, Arnold; Bates, William; Johnson, Ken-E; Kobelski, Bruce
Subject: RE: Amended Draft Response Plan

Hi Kurt. I took a quick look at the plan and agree it has a lot of consistency with some of our approaches. I like their strategy to improve their seismic network including the mobile array. Interesting effort to try to quantify risk and determine when to act. There are so many complexities that make quantifying difficult. They appear to have approached this by using some conservative assumptions. However, the 6 mile radius they use does not appear conservative to me because of uncertainties in earthquake locations and potential distances of injection pressure influence in some fractured reservoirs. This is a key component of the equation and at a minimum, I would better justify the selection of a 6 mile radius. It would be also good to take some known historic cases (including ours) and apply the equation to these cases. Thanks.

From: Hildebrandt, Kurt
Sent: Friday, September 12, 2014 9:05 AM
To: Dorsey, Nancy; Lawrence, Rob; Bierschenk, Arnold; Bates, William; Dellinger, Philip; Johnson, Ken-E; Kobelski, Bruce
Subject: FW: Amended Draft Response Plan

FYI – If you have the time or inclination to look this over and offer any thoughts, you are more than welcome to do so. They have extended the comment period through 5 p.m. on September 19. In doing a quick look, it seems to fall in line with a lot of what we have suggested in our practical approach on dealing with the subject.

From: Jesse Borjon [<mailto:j.borjon@kcc.ks.gov>]
Sent: Thursday, September 11, 2014 6:57 PM
To: Jesse Borjon
Subject: FW: Amended Draft Response Plan

Good evening. It has come to the attention of the State Force on Induced Seismicity that some participants may not have received the amended draft response plan. Please find a Stakeholder Memo, Seismic Action Plan (Amended),

and Response to Comments documents attached. The Task Force is seeking comments on the amended Seismic Action Plan as outlined in the Stakeholder Memo. Please let me know if you have questions. Jesse

Jesse Borjon, *Director*
Public Affairs and Consumer Protection
Kansas Corporation Commission
Phone (785) 271-3269

Dorsey, Nancy

From: Dorsey, Nancy
Sent: Monday, September 08, 2014 12:35 PM
To: 'Charles Lord'
Subject: RE: C J Judy

Looks like a vacuum to me. ☺ Do you know if they actually have tubing inside the 7", and if so what size it is please?

From: Charles Lord [mailto:C.Lord@occeemail.com]
Sent: Monday, September 08, 2014 11:35 AM
To: Dorsey, Nancy
Subject: RE: C J Judy

The FI for the area just handed me his report on the Judy.

-28 PSI

From: Dorsey, Nancy [mailto:Dorsey.Nancy@epa.gov]
Sent: Monday, September 08, 2014 9:16 AM
To: Charles Lord
Subject: C J Judy

Is the 9-2 data, the daily disposal volumes? Do you have pressures to match or is it on vacuum?

Thanks,
Nancy

Nancy S. Dorsey
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Dorsey, Nancy

From: Dorsey, Nancy
Sent: Tuesday, May 13, 2014 9:37 AM
To: zahidf@ou.edu
Subject: RE: wastewater injection

Dear Sofia,

Thank you for your enquiry, EPA just published a call for comments on 'Enhancing Transparency for Chemicals and Mixtures Used in Hydraulic Fracturing'. Please use the following link to read the news release from May 9, 2014.

<http://yosemite.epa.gov/opa/admpress.nsf/0/EA058B80944B150D85257CD30050C710>

Oklahoma Corporation Commission current rules (Oklahoma Title 165:10-3-10 for well completion operations) require operators to report information on hydraulic fracturing fluid components to FracFocus. FracFocus is a national hydraulic fracturing chemical registry (data base) managed by the Ground Water Protection Council and Interstate Oil and Gas Compact Commission. <http://fracfocus.org/>

Sincerely,

Nancy S. Dorsey
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----- Forwarded by Bruce Fitch/R6/USEPA/US on 05/12/2014 02:02 PM -----

Region 6 Internet Feedback - <http://www.epa.gov/earth1r6>

Sunday 05/11/2014 at 10:01 PM

Name: Sofia
E-Mail Address: zahidf@ou.edu
Category:
Status:

DO NOT use the "Comments" field for responses.

If you wish to respond to this message, select the "New Response" button above.

For more information, select the "Help" button above.

[Return to Database "By Category"](#)

Comments:

DO NOT use the "Comments" field for responses. For more information, select the "Help" button above.

Contact:

Number:

Subject:wastewater injection

Message: Good Evening,

My name is Sofia Ahmad and I am a student at the University of Oklahoma. I have been following the increase in earthquakes situation in Oklahoma for the last few years, and through research linked it to the increase in wastewater injections. Recently I saw the report by the USGS about the increase in earthquakes linked to wastewater injection as well. As you are probably aware the EPA and administration have taken the first step toward the federal regulation of chemicals used in fracking, a drilling technique that has transformed energy production while eluding oversight sought by environmentalists. However, the states mentioned did not include Oklahoma..My question is whether we can take a stand in Oklahoma to have the companies inform the EPA and public of what chemicals are used for fracking so we can once and for all determine not only the link to earthquakes but also the safety of our water.

Many Thanks,
Concerned Student

zahidf@ou.edu

Assigned To:

Assigned Date:

Validate: 64932

WebForm: r6coment.htm

Edit History:

14/05/11 11:01 PM Created by Anonymous - Category:

Dorsey, Nancy

From: Bill Leith <wleith@usgs.gov>
Sent: Monday, May 12, 2014 8:36 PM
To: Dorsey, Nancy
Subject: Re: 2nd USGS-OGS Joint Statement on Oklahoma earthquakes

We got LOTS of media interest this time, as you might have seen.

Hope all is well,

--Bill

On May 12, 2014, at 3:52 PM, Dorsey, Nancy wrote:

Belated thanks for the heads up Bill.
Nancy

From: Bill Leith [mailto:wleith@usgs.gov]
Sent: Monday, May 05, 2014 2:28 PM
To: Moore, Keara; Dellinger, Philip; Overbay, Michael; Johnson, Ken-E; Dorsey, Nancy; Bates, William; Ginsberg, Marilyn; Lawrence, Rob
Subject: 2nd USGS-OGS Joint Statement on Oklahoma earthquakes

Importance: High
EPA Colleagues,

A joint statement by the USGS and the Oklahoma Geological Survey (OGS) on earthquakes in Oklahoma was released today, updating the joint statement that was released six months ago. The new statement can be found [here](#); the accompanying media release is included below, and is also accessible through the [USGS home page](#) and [earthquake.usgs.gov](#).

A short synopsis of the statement is as follows: The remarkable increase in small-to-moderate size earthquakes that has occurred in the past 6 months in central and north-central Oklahoma has significantly raised the likelihood of larger, potentially damaging earthquakes there. A likely contributing factor to the increase in earthquakes is triggering by wastewater injected into deep geologic formations.

With regards,

--Bill Leith

William Leith, Ph.D.
Senior Science Advisor for Earthquake
and Geologic Hazards
U.S. Geological Survey
905 National Center, Reston VA 20192
tel 703-648-6786
msg 703-648-6715
fax 703-648-6717
[if it's really urgent, don't use email]

This release can be found in the USGS Newsroom at: <http://www.usgs.gov/newsroom/article.asp?ID=3880>.

Record Number of Oklahoma Tremors Raises Possibility of Damaging Earthquakes

The rate of earthquakes in Oklahoma has increased by about 50 percent since October 2013, significantly increasing the chance for a damaging quake in central Oklahoma.

In a new [joint statement](#) by the U.S. Geological Survey and Oklahoma Geological Survey, the agencies reported that 183 earthquakes of magnitude 3.0 or greater occurred in Oklahoma from October 2013 through April 14, 2014. This compares with a long-term average from 1978 to 2008 of only two magnitude 3.0 or larger earthquakes per year. As a result of the increased number of small and moderate shocks, the likelihood of future, damaging earthquakes has increased for central and north-central Oklahoma.

“We hope that this new advisory of increased hazard will become a crucial consideration in earthquake preparedness for residents, schools and businesses in the central Oklahoma area,” said Dr. Bill Leith, USGS Senior Science Advisor for Earthquakes and Geologic Hazards. “Building owners and government officials should have a special concern for older, unreinforced brick structures, which are vulnerable to serious damage during sufficient shaking.”

The joint statement indicates that a likely contributing factor to the increase in earthquakes is wastewater disposal by injection into deep geologic formations. The water injection can increase underground pressures, lubricate faults and cause earthquakes – a process known as injection-induced seismicity. Much of this wastewater is a byproduct of oil and gas production and is routinely disposed of by injection into wells specifically designed and approved for this purpose. The recent earthquake rate changes are not due to typical, random fluctuations in natural seismicity rates.

Oklahoma’s heightened earthquake activity since 2009 includes 20 magnitude 4.0 to 4.8 quakes, plus one of the two largest recorded earthquakes in Oklahoma’s history – a magnitude 5.6 earthquake that occurred near Prague on Nov. 5, 2011, which damaged a number of homes and the historic Benedictine Hall at St. Gregory's University in Shawnee.

As a result of the increased seismicity, the Oklahoma Geological Survey has increased the number of monitoring stations and now operates a seismograph network of 15 permanent stations and 17 temporary stations. Both agencies are actively involved in research to determine the cause of the increased earthquake rate and to quantify the increased hazard in central Oklahoma.

Information about earthquake preparedness can be found at the following websites:

<http://www.ready.gov/earthquakes> and <http://www.shakeout.org/centralus/>.

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Subscribe to our news releases via [e-mail](#), [RSS](#) or [Twitter](#).

Links and contacts within this release are valid at the time of publication.

Dorsey, Nancy

From: Mayer, Rebecca
Sent: Wednesday, May 07, 2014 2:24 PM
To: Taheri, Diane; Gray, David; Dellinger, Philip
Cc: McCorkhill, Michael; Durant, Jennah; Hubbard, Joseph; Dorsey, Nancy
Subject: Animation of Oklahoma Earthquakes: January 2, 2008 - April 30, 2014 from USGS

FYI. This animation was tweeted out by State Impact Texas.

<http://earthquake.usgs.gov/regional/ceus/products/OKeqanimation.php>

StateImpact Texas @StateImpactTX 7m

RT @jimbluewind: Stunning USGS Animation of Oklahoma Seismicity: January 2, 2008 - April 30, 2014
[.earthquake.usgs.gov/regional/ceus/.....](http://earthquake.usgs.gov/regional/ceus/)

Rebecca Mayer
Public Affairs Specialist
U.S. Environmental Protection Agency, Region 6
Office of External Affairs
214-665-7302

Dorsey, Nancy

From: Holland, Austin A. <austin.holland@ou.edu>
Sent: Tuesday, May 06, 2014 5:00 PM
To: Sickbert, Tim
Cc: Dorsey, Nancy; Abdel Salam, Mohamed
Subject: Re: UIC Class 2 well information

I can get it to you, but it is far too large to email. I am not sure of the best way to get it to you. I will check here and see.

Regards,

Austin A. Holland

Research Seismologist | Oklahoma Geological Survey

The University of Oklahoma Mewbourne College of Earth and Energy

Sarkeys Energy Center, 100 E. Boyd St., Room E-128, Norman, OK 73019-0628

austin.holland@ou.edu | PH: (405) 325-8497 | CELL: (405) 361-9967 | FAX 325-7069

From: , Tim <sickber@okstate.edu>
Date: Tuesday, May 6, 2014 at 4:51 PM
To: Austin Holland <austin.holland@ou.edu>
Cc: "Dorsey.Nancy@epamail.epa.gov" <Dorsey.Nancy@epamail.epa.gov>, "Abdel Salam, Mohamed" <mohamed.abdel_salam@okstate.edu>
Subject: FW: UIC Class 2 well information

Austin –

Good evening.

Nancy Dorsey (EPA Region 6, Dallas) mentions in her e-mail, below, that OCC has compiled some of the information on UIC Class II injection wells from their databases for you. Is the information they have compiled useful? And can you share it? It would certainly save me many hours of going through their online database and images of forms.

Thanks.

Tim

From: Dorsey, Nancy [<mailto:Dorsey.Nancy@epa.gov>]
Sent: Tuesday, May 06, 2014 12:51 PM
To: Sickbert, Tim
Cc: Dellinger, Philip; Atekwana, Estella; Abdel Salam, Mohamed; Lao Davila, Daniel; Charles Lord; Tim Baker; Hurlbut, Bill; Bierschenk, Arnold; Johnson, Ken-E
Subject: RE: UIC Class 2 well information

Hello Tim,

EPA has oversight of the Oklahoma Underground Injection Control (UIC) programs and direct implementation for certain Tribal programs in Oklahoma. The oil and gas part of the program, Class II, is primarily delegated to the Oklahoma Corporation Commission (OCC) with the exception of certain Tribal lands, primarily in Osage County. Information on state Class II UIC wells may be obtained from their website:

<http://www.occeweb.com/Orawebapps/OCCOraWebAppsone.html> (see the data mining options). Information on Osage

Class II Wells, would be obtained through a FOIA request. I handle OCC Class II oversight, Bill Hurlbut handles the tribal Class II permits and activity.

Alternately, because of the seismicity concern, OCC has compiled some of the information and passed it to the Oklahoma Geologic Survey for distribution to those conducting seismicity research.

Pulling a recommendation from the EPA's draft report*, while working on your project, consultation with petroleum engineers, particularly those with oil and gas experience, may greatly improve the validity of your project outcome. The understanding of rock mechanics and pressure influence is very different between the two disciplines, as much from a function of scale as it is the purpose for which they were developed. You may also wish to peruse some of the UIC documentation available on the Drinking Water Academy website:

<http://water.epa.gov/learn/training/dwatrainng/training.cfm> particularly the Nuts and Bolts of Fall-Off Testing.

Regards,

Nancy Dorsey

* Released through a FOIA via Inside EPA, <http://insideepa.com/201403282465816/EPA-Daily-News/Daily-News/novel-suit-seeks-to-mandate-epa-review-of-seismic-risks-for-uic-permits/menu-id-95.html>

Nancy S. Dorsey

Environmental Scientist

Oklahoma Class II Program Manager

WQ-SG EPA Region 6

1445 Ross Ave. #1200

Dallas, TX 75202-2733

214-665-2294

FAX 214-665-2191

From: Sickbert, Tim [<mailto:sickber@okstate.edu>]

Sent: Monday, May 05, 2014 11:34 AM

To: Dorsey, Nancy

Cc: Dellinger, Philip; Atekwana, Estella; Abdel Salam, Mohamed; Lao Davila, Daniel

Subject: UIC Class 2 well information

Nancy –

Good morning. I am a Ph.D. student at Oklahoma State University and have recently re-directed my research from Arbuckle Mountain structural geology to the recent and ongoing earthquakes in, especially, central and north-central Oklahoma. We have ten tri-axial broadband seismometers on order and anticipate deploying them beginning in early July. Dr. Daniel Laó-Dávila has eight UNAVCO-style GPS campaign kits that he anticipates deploying this summer to determine if the earthquakes are deforming the surface. In the meantime, I have been working with two borrowed seismometers, and setting up and learning the systems and software to process seismic traces. We have also acquired a RADARSAT-2 image of part of north-central Oklahoma to serve as the base image for InSAR (Interferometric Synthetic Aperture Radar) analysis. Within the Boone Pickens School of Geology, additional methods of research are being considered.

In part based on the reports that disposal wells may have induced the November 2011 Prague sequence, I would like to get whatever information is available on UIC Class 2 wells in the central Oklahoma region. Mark Crismon has said that he has spoken with Philip Dellinger and learned that you would at least be able to direct me to a good source for the information. I greatly appreciate any assistance you would be able to give.

Best regards,

Tim

Tim Sickbert

Devon Labs Coordinator, & student

Boone Pickens School of Geology

105 Noble Research Center

Oklahoma State University

Stillwater OK 74078-3031

Phone (405) 744-6271

Fax (405) 744-7841

Tim.Sickbert@okstate.edu

Dorsey, Nancy

From: Sickbert, Tim <sickber@okstate.edu>
Sent: Tuesday, May 06, 2014 4:52 PM
To: Holland, Austin A. (austin.holland@ou.edu)
Cc: Dorsey, Nancy; Abdel Salam, Mohamed
Subject: FW: UIC Class 2 well information

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To: Sickbert, Tim
Cc: Dellinger, Philip; Atekwana, Estella; Abdel Salam, Mohamed; Lao Davila, Daniel; Charles Lord; Tim Baker; Hurlbut, Bill; Bierschenk, Arnold; Johnson, Ken-E
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<http://water.epa.gov/learn/training/dwatrainng/training.cfm> particularly the Nuts and Bolts of Fall-Off Testing.

Regards,

Nancy Dorsey

* Released through a FOIA via Inside EPA, <http://insideepa.com/201403282465816/EPA-Daily-News/Daily-News/novel-suit-seeks-to-mandate-epa-review-of-seismic-risks-for-uic-permits/menu-id-95.html>

Nancy S. Dorsey
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Oklahoma Class II Program Manager
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Dallas, TX 75202-2733
214-665-2294
FAX 214-665-2191

From: Sickbert, Tim [<mailto:sickber@okstate.edu>]

Sent: Monday, May 05, 2014 11:34 AM

To: Dorsey, Nancy

Cc: Dellinger, Philip; Atekwana, Estella; Abdel Salam, Mohamed; Lao Davila, Daniel

Subject: UIC Class 2 well information

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Tim

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Oklahoma State University

Stillwater OK 74078-3031

Phone (405) 744-6271

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Tim.Sickbert@okstate.edu

Dorsey, Nancy

From: Sickbert, Tim <sickber@okstate.edu>
Sent: Tuesday, May 06, 2014 4:48 PM
To: Dorsey, Nancy
Cc: Dellinger, Philip; Atekwana, Estella; Abdel Salam, Mohamed; Lao Davila, Daniel; Charles Lord; Tim Baker; Hurlbut, Bill; Bierschenk, Arnold; Johnson, Ken-E
Subject: RE: UIC Class 2 well information

Nancy –

Thank you for the links and for your constructive comments. I have dug into the OCC web site at least a few times, but always put off pursuing it deeply because I have not been able to find latitude/longitude or similar coordinates for the wells, and have not yet been willing to commit the time to place them manually using PLSS. Before I start on that, I will ask Austin Holland if he has and can share any data files on the UIC wells.

All the best,

Tim

From: Dorsey, Nancy [mailto:Dorsey.Nancy@epa.gov]
Sent: Tuesday, May 06, 2014 12:51 PM
To: Sickbert, Tim
Cc: Dellinger, Philip; Atekwana, Estella; Abdel Salam, Mohamed; Lao Davila, Daniel; Charles Lord; Tim Baker; Hurlbut, Bill; Bierschenk, Arnold; Johnson, Ken-E
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Sent: Monday, May 05, 2014 11:34 AM
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Tim.Sickbert@okstate.edu

Dorsey, Nancy

From: Bill Leith <wleith@usgs.gov>
Sent: Monday, May 05, 2014 2:28 PM
To: Moore, Keara; Dellinger, Philip; Overbay, Michael; Johnson, Ken-E; Dorsey, Nancy; Bates, William; Ginsberg, Marilyn; Lawrence, Rob
Subject: 2nd USGS-OGS Joint Statement on Oklahoma earthquakes
Importance: High

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--Bill Leith

William Leith, Ph.D.
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[if it's really urgent, don't use email]

This release can be found in the USGS Newsroom at: <http://www.usgs.gov/newsroom/article.asp?ID=3880>.



News Release

May 5, 2014

Marisa Lubeck

303-202-4765

mlubeck@usgs.gov

Record Number of Oklahoma Tremors Raises Possibility of Damaging Earthquakes

The rate of earthquakes in Oklahoma has increased by about 50 percent since October 2013, significantly increasing the chance for a damaging quake in central Oklahoma.

In a new [joint statement](#) by the U.S. Geological Survey and Oklahoma Geological Survey, the agencies reported that 183 earthquakes of magnitude 3.0 or greater occurred in Oklahoma from October 2013 through April 14, 2014. This compares with a long-term average from 1978 to 2008 of only two magnitude 3.0 or larger earthquakes per year. As a result of the increased number of small and moderate shocks, the likelihood of future, damaging earthquakes has increased for central and north-central Oklahoma.

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<http://www.ready.gov/earthquakes> and <http://www.shakeout.org/centralus/>.

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Subscribe to our news releases via [e-mail](#), [RSS](#) or [Twitter](#).

Links and contacts within this release are valid at the time of publication.

Dorsey, Nancy

From: Holland, Austin A. <austin.holland@ou.edu>
Sent: Monday, April 07, 2014 3:28 PM
To: Dorsey, Nancy
Subject: Re: seismometer locations?

That's correct. We will be adding 8 more permanent stations to the network over the next year.

From: , Nancy <Dorsey.Nancy@epa.gov>
Date: Monday, April 7, 2014 at 2:24 PM
To: Austin Holland <austin.holland@ou.edu>
Subject: RE: seismometer locations?

Thanks!

So I understand, the stations listed on the OGS website are just the temporary network? The ones on the IRIS network are permanent or were previously active depending on the date range?

From: Holland, Austin A. [<mailto:austin.holland@ou.edu>]
Sent: Monday, April 07, 2014 2:46 PM
To: Dorsey, Nancy
Cc: Darold, Amberlee P.
Subject: Re: seismometer locations?

It will take me a little longer to get the rest of the stations that are more regional and much further north. I am not sure what you need. Keep in mind the currently to respond to other stuff we have removed or moved some of these. In addition we were going to upgrade CDOK to a permanent station but there are new wells going in on the property and with all the truck traffic it seemed like a very poor use of resources.

Id;sta;net;start time; stop time;latitude;longitude;elevation m;location description;state;county;closed;accelerometer
1;"LOV6";"OK";"";"2013-10-09 00:00:00";"2013-03-31 22:00:00";34.097452;-97.211714;265;"Crinerville Rd."; "Oklahoma"; "Love"; TRUE; FALSE
2;"LOV1";"OK";"";"2013-09-25 00:00:00";"";34.059342;-97.240835;267;"Marsden"; "Oklahoma"; "Love"; FALSE; FALSE
3;"RLO";"OK";"";"36.167;-95.0255;365;"Rose Lookout"; "Oklahoma"; ""; TRUE; FALSE
4;"LOV2";"OK";"";"2013-09-25 00:00:00";"2013-10-02 16:00:00";33.969538;-97.195752;263;"N 3256 RD Marietta"; "Oklahoma"; "Love"; TRUE; FALSE
5;"LOV3";"OK";"";"2013-10-01 00:00:00";"";34.012989;-97.084779;205;"Mayes Ln, Marietta"; "Oklahoma"; "Love"; FALSE; FALSE
6;"LOV4";"OK";"";"2013-09-26 00:00:00";"2014-01-30 17:00:00";34.027771;-97.161002;223;"Oswalt Rd., Marietta"; "Oklahoma"; "Love"; TRUE; FALSE
7;"LOV5";"OK";"";"2013-09-27 00:00:00";"";34.024699;-97.158551;240;"Oswalt Rd., Marietta"; "Oklahoma"; "Love"; FALSE; FALSE
8;"LOV7";"OK";"";"2014-01-30 20:00:00";"";33.999248;-97.268152;217;"Buckskin Rd., Overbook"; "Oklahoma"; "Love"; FALSE; FALSE
9;"CDOK";"OK";"";"2013-10-02 16:00:00";"";33.994425;-97.181046;285;"New Hope Rd., Marietta"; "Oklahoma"; "Love"; FALSE; FALSE

From: , Nancy <Dorsey.Nancy@epa.gov>
Date: Monday, April 7, 2014 at 1:15 PM
To: Austin Holland <austin.holland@ou.edu>
Subject: RE: seismometer locations?

Thanks!

From: Holland, Austin A. [<mailto:austin.holland@ou.edu>]
Sent: Monday, April 07, 2014 2:15 PM
To: Dorsey, Nancy
Subject: Re: seismometer locations?

We have not been sending our temporary network for Love County to IRIS. I can get you a list in a few minutes.

From: , Nancy <Dorsey.Nancy@epa.gov>

Date: Monday, April 7, 2014 at 12:50 PM

To: Austin Holland <austin.holland@ou.edu>

Subject: seismometer locations?

Hi Austin,

I tried to pull the location of the OGS seismometer network, but it isn't accessible from your stations page. So, I went to IRIS and pulled down a list from Oklahoma, but the codes don't match. Are there two different sets or just different names please?

Station
LOV1
LOV7
CDOK
LOV3
LOV5
LOV6
X37A
W35A
FNO
WMOK

Station	Site
BCOK	Bluff Creek, North Oklahoma City, Oklahoma
CROK	Carrier, Oklahoma
FNO	Franklin, Norman, OK
OKCFA	Farley, Oklahoma City, OK
OKCSW	Sweetheart, Southeast Oklahoma City, Oklahoma
U32A	Winter Ranch, Mooreland, OK, USA
W35A	Tecumseh, Oklahoma, USA
X34A	Smith Ranch, Marlow, OK, USA
X37A	Clayton, OK, USA

Thanks,

Nancy

Nancy S. Dorsey

Environmental Scientist

Oklahoma Class II Program Manager

WQ-SG EPA Region 6

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Rd."; "Oklahoma"; "Love"; TRUE; FALSE
2;"LOV1";"OK";"";"2013-09-25 00:00:00";"";34.059342;-97.240835;267;"Marsden"; "Oklahoma"; "Love"; FALSE; FALSE
3;"RLO";"OK";"";"36.167;-95.0255;365;"Rose Lookout"; "Oklahoma"; ""; TRUE; FALSE
4;"LOV2";"OK";"";"2013-09-25 00:00:00";"2013-10-02 16:00:00";33.969538;-97.195752;263;"N 3256 RD
Marietta"; "Oklahoma"; "Love"; TRUE; FALSE
5;"LOV3";"OK";"";"2013-10-01 00:00:00";"";34.012989;-97.084779;205;"Mayes Ln, Marietta"; "Oklahoma"; "Love"; FALSE; FALSE
6;"LOV4";"OK";"";"2013-09-26 00:00:00";"2014-01-30 17:00:00";34.027771;-97.161002;223;"Oswalt Rd.,
Marietta"; "Oklahoma"; "Love"; TRUE; FALSE
7;"LOV5";"OK";"";"2013-09-27 00:00:00";"";34.024699;-97.158551;240;"Oswalt Rd.,
Marietta"; "Oklahoma"; "Love"; FALSE; FALSE
8;"LOV7";"OK";"";"2014-01-30 20:00:00";"";33.999248;-97.268152;217;"Buckskin Rd.,
Overbook"; "Oklahoma"; "Love"; FALSE; FALSE
9;"CDOK";"OK";"";"2013-10-02 16:00:00";"";33.994425;-97.181046;285;"New Hope Rd.,
Marietta"; "Oklahoma"; "Love"; FALSE; FALSE

From: , Nancy <Dorsey.Nancy@epa.gov>
Date: Monday, April 7, 2014 at 1:15 PM
To: Austin Holland <austin.holland@ou.edu>
Subject: RE: seismometer locations?

Thanks!

From: Holland, Austin A. [<mailto:austin.holland@ou.edu>]
Sent: Monday, April 07, 2014 2:15 PM
To: Dorsey, Nancy
Subject: Re: seismometer locations?

We have not been sending our temporary network for Love County to IRIS. I can get you a list in a few minutes.

From: , Nancy <Dorsey.Nancy@epa.gov>
Date: Monday, April 7, 2014 at 12:50 PM
To: Austin Holland <austin.holland@ou.edu>
Subject: seismometer locations?

Hi Austin,

I tried to pull the location of the OGS seismometer network, but it isn't accessible from your stations page. So, I went to IRIS and pulled down a list from Oklahoma, but the codes don't match. Are there two different sets or just different names please?

Station

LOV1
LOV7
CDOK
LOV3
LOV5
LOV6
X37A
W35A
FNO
WMOK

Station	Site
BCOK	Bluff Creek, North Oklahoma City, Oklahoma
CROK	Carrier, Oklahoma
FNO	Franklin, Norman, OK
OKCFA	Farley, Oklahoma City, OK
OKCSW	Sweetheart, Southeast Oklahoma City, Oklahoma
U32A	Winter Ranch, Mooreland, OK, USA
W35A	Tecumseh, Oklahoma, USA
X34A	Smith Ranch, Marlow, OK, USA
X37A	Clayton, OK, USA

Thanks,

Nancy

Nancy S. Dorsey

Environmental Scientist

Oklahoma Class II Program Manager

WQ-SG EPA Region 6

1445 Ross Ave. #1200

Dallas, TX 75202-2733

214-665-2294

FAX 214-665-2191

Dorsey, Nancy

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Thanks,

Nancy

Nancy S. Dorsey
Environmental Scientist
Oklahoma Class II Program Manager
WQ-SG EPA Region 6
1445 Ross Ave. #1200

Dallas, TX 75202-2733
214-665-2294
FAX 214-665-2191

Dorsey, Nancy

From: Holland, Austin A. <austin.holland@ou.edu>
Sent: Tuesday, March 25, 2014 8:14 AM
To: Dorsey, Nancy; earthquake@okgeosurvey1.gov
Subject: Re: Ask a seismologist

If we had a moments peace we might be able to implement a REST service. One issue though is that there is no standard format for such stuff. Hope that is helpful.

That means that there is something terribly wrong with the location, either the location is poorly constrained there are bad phase picks or something even worse. Normally I catch those, and we would go back and look at them but we haven't gotten anywhere near looking at all of the earthquakes in 2014 yet.

Regards,

Austin A. Holland

Research Seismologist | Oklahoma Geological Survey

The University of Oklahoma Mewbourne College of Earth and Energy

Sarkeys Energy Center, 100 E. Boyd St., Room E-128, Norman, OK 73019-0628

austin.holland@ou.edu | PH: (405) 325-8497 | CELL: (405) 361-9967 | FAX 325-7069

From: , Nancy <Dorsey.Nancy@epa.gov>
Date: Monday, March 24, 2014 at 2:42 PM
To: "earthquake@okgeosurvey1.gov" <earthquake@okgeosurvey1.gov>
Subject: Ask a seismologist

I downloaded your 2014 earthquake catalog. (Very handy, thank you!) I plan to show the uncertainty around the event origins. I notice that the longitudinal and latitudinal errors run up to 122 km in uncertainty. How is that possible, please? Also, is your data available through a REST service?

Thank you,

Nancy

Nancy S. Dorsey

Environmental Scientist

Oklahoma Class II Program Manager

WQ-SG EPA Region 6

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214-665-2294

FAX 214-665-2191

Dorsey, Nancy

From: Dorsey, Nancy
Sent: Monday, March 10, 2014 3:11 PM
To: 'Charles Lord'; 'James Phelps'; 'Patricia Downey'
Subject: processing permit 1108220062 TD in Granite

Importance: High

Hi folks,

Just an FYI, the 119-23771 Woods SWDW has an order 533126 and filed a permit application 1108220062 to increase the rate and pressure. The injection zone is Arbuckle. The 1002A shows TD is granite, literally same depth as the TD.

Not sure what if anything you want to do with that. ☺

On a separate note, is OCC considering having any of their UIC inspectors take the training in April over a video link? I think Omar sent out the notice.

Nancy

Nancy S. Dorsey
Environmental Scientist
Oklahoma Class II Program Manager
WQ-SG EPA Region 6
1445 Ross Ave. #1200
Dallas, TX 75202-2733
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Dorsey, Nancy

From: Stephen Patrick Horton (shorton) <shorton@memphis.edu>
Sent: Thursday, January 23, 2014 8:58 AM
To: Dellinger, Philip
Cc: McKenzie, Susie; Dorsey, Nancy
Subject: Speaker for Induced seismicity session at Earthquake Hazards workshop

Phillip,

Would you or a colleague present a short (30 minute) overview of the UIC program during a special session on induced seismicity at a Central and Eastern U.S. Earthquake Hazards workshop to be held at the University of Memphis on February 25-26, 2014. The meeting will be hosted by The Center for Earthquake Research and Information (CERI), the West Tenn. Seismic Safety Commission, and the USGS. We expect it to be attended by about 30 researchers from the USGS, academia, and private industry. This is a CEUS NEHRP research review and planning workshop to help determine how to spend research dollars in the near future.

Specifically, we would like the regulators perspective on induced seismicity related to fluid injection. Perhaps you could speak to what the state commissions have been doing, and the status and contents of the EPA guidelines.

The speakers travel will be covered.

Best regards,
Steve Horton
901-678-4896

From: Dellinger.Philip@epamail.epa.gov [mailto:Dellinger.Philip@epamail.epa.gov]
Sent: Tuesday, August 16, 2011 11:49 AM
To: Stephen Patrick Horton (shorton)
Cc: McKenzie.Susie@epamail.epa.gov
Subject: RE: Induced seismicity

Steve, we are definitely interested in meeting with both of you. Let me know the time that works best for you and we will set it up on the 15th . Thanks.

RE: Induced seismicity

Stephen Patrick Horton (shorton)

08/12/2011 10:26 AM

To: Philip Dellinger



From: "Stephen Patrick Horton (shorton)" <shorton@memphis.edu>

To: Philip Dellinger/R6/USEPA/US@EPA

Phillip,

Scott Ausbrooks (Arkansas Geological Survey) and I will be presenting our work on the recent Arkansas Earthquakes (to the study committee of the National Academy of Science on “Induced seismicity potential in energy technologies”) in Dallas on September 14. If you are interested we could discuss our results with you and your colleagues are while we are in town (preferably the following day). Let me know soon if you are interested. We are making our trip plans now.

Regards,
steve

From: Dellinger.Philip@epamail.epa.gov [<mailto:Dellinger.Philip@epamail.epa.gov>]

Sent: Wednesday, August 10, 2011 11:29 AM

To: Stephen Patrick Horton (shorton)

Subject: Induced seismicity

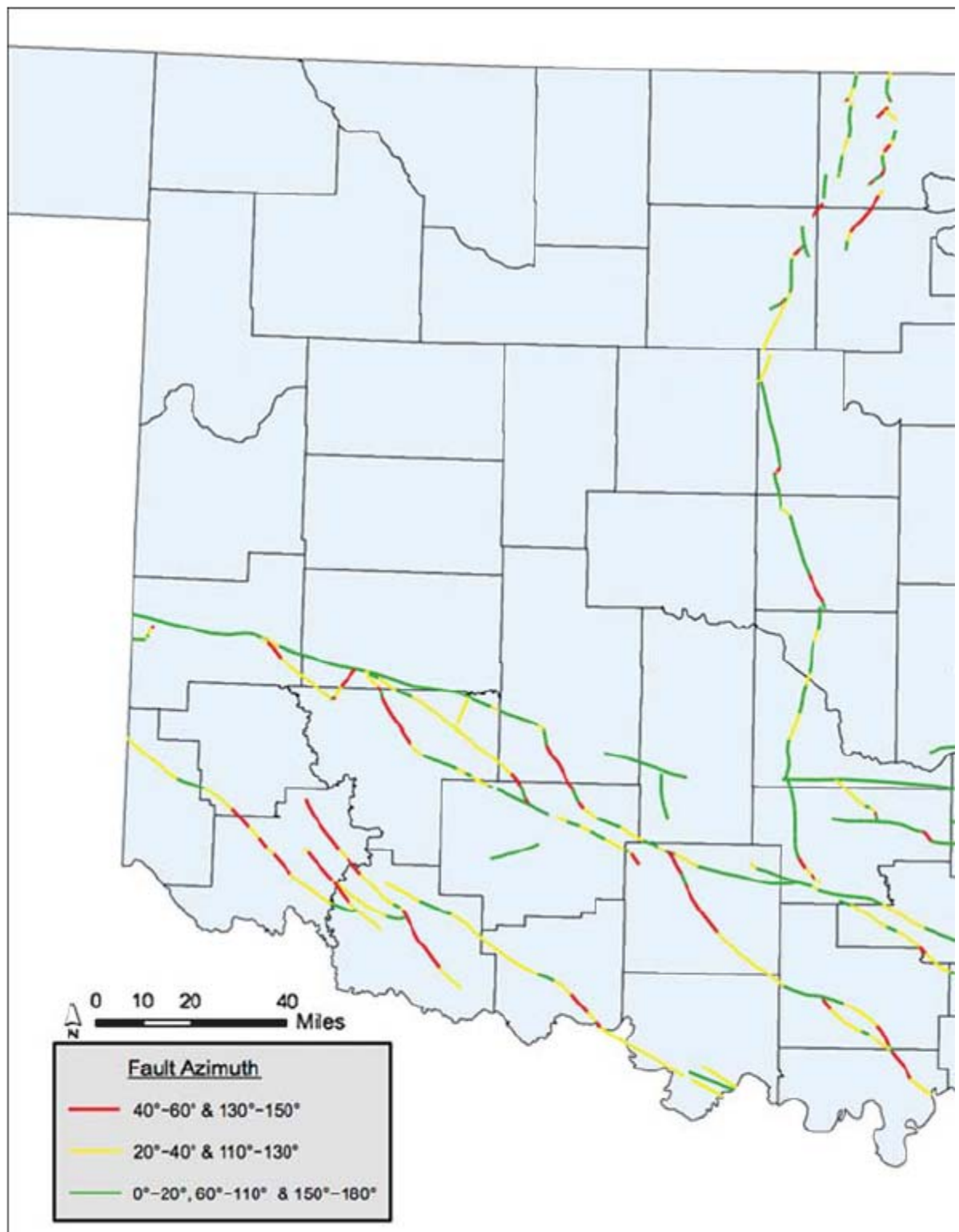
Hello Dr. Horton. My name is Philip Dellinger and I am over the Underground Injection Control Program for the EPA Region 6 office. Late last year, I spoke with you by phone on the recent earthquakes in Arkansas. EPA has established a workgroup for developing guidelines for addressing/preventing induced seismicity. These would target injection well regulators and we (EPA Region 6) have been requested to lead the effort. One of our strategies is to contact researchers to solicit input or recommendations. I would like to speak to you on this matter at your convenience. Please call me at 214-665-8324 if you are interested in providing input into this effort . Thanks.

Philip Dellinger, Chief
Ground Water/UIC Section
EPA Region 6
Dallas, TX 75202

Dorsey, Nancy

From: Charles Lord <C.Lord@occeemail.com>
Sent: Monday, January 13, 2014 9:35 AM
To: Austin Holland
Subject: Statewide fault map with orientation to regional stress

Austin, do you have the shapefile used to produce this map.



If you do please send me a copy.

Thanks,

Charles Lord
Program Manager UIC
Oklahoma Corporation Commission
Post Office Box 52000
Oklahoma City, Oklahoma 73152
(405)522-2751
c.lord@occcemail.com

From: holland.austin@gmail.com [mailto:holland.austin@gmail.com] **On Behalf Of** Austin Holland
Sent: Saturday, November 02, 2013 5:04 PM
To: Gibson, Amie R.; Randy Keller; Charles Lord; Ron Dunkin
Subject: Edmond Quakes

I have attached a figure with the last 24 hours of earthquakes, and the last 30 days in the area as well. In addition I included a figure of the seismogram/helicorder plot of the last 24 hours in time. I was able to calculate 3 focal mechanisms for the largest earthquakes. They are strike-slip most likely north-south faults similar to what we see for other northern Oklahoma County/Jones swarm earthquakes.

--

Austin Holland
Research Seismologist
Oklahoma Geological Survey
(405)325-8497